

REMARKS

Claims 1-18 are pending in this application and claims 1-3, 5-10, 12, 13, 15 and 17 are withdrawn from consideration. By this Amendment, claim 4 is amended. Support for this amendment can be found, at least, in Fig. 4 of Applicants' specification. No new matter is added.

I. Objection to the Claims

Claim 4 is objected to as allegedly containing informalities. Claim 4, as amended, no longer contains these informalities. Applicants respectfully request withdrawal of the objection to the claims.

II. 35 U.S.C. §103(a) Rejection

Claims 4, 11, 14, 16, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,746,798 to Hiratsuka et al. ("Hiratsuka") in view of U.S. Patent No. 5,279,623 to Watanabe et al. ("Watanabe"). Applicants respectfully traverse this rejection.

Hiratsuka is directed to a structure for sealing an outer can and a cover. See Abstract of Hiratsuka. Hiratsuka's objective is to reduce the weight of a rectangular and sealed battery and to guarantee the reliability of the welding. To achieve the objective, Hiratsuka discloses that it is necessary to maintain a thickness of the cover more than 0.3mm. See col. 1, line 66 - col. 2, line 4 of Hiratsuka.

The Office Action alleges that Hiratsuka discloses "a cap having a contact surface facing the flange of the can." However, Hiratsuka discloses that the flange makes no contact with the cover.

Hiratsuka discloses that the shape of its flange is designed to maintain a portion large enough for welding, while allowing the weight of a rectangular and sealed battery to be reduced. See col. 2, lines 35-46 of Hiratsuka. Hiratsuka discloses that the cover 2 has a step

inserted into the outer can to increase welding reliability and minimize a gap between the cover and the outer case. See col. 6, lines 8-14 of Hiratsuka. Further, the flange of Hiratsuka supports the cover when the step of the cover is inserted into the outer can, and the end of the outer can is to reduce the thickness of the outer can and to maintain an enough welding portion. Further, the shape of the cover of Hiratsuka is not for an easy welding operation or an installment of a cooling jig. As such, Hiratsuka does not disclose that the flange makes contact with the cap and the can.

Claim 4, as amended, recites "a cap having a contact surface facing the flange of the can and the cap is not inserted into the can." Hiratsuka discloses that its cover 2 has a step formed toward the inside of its can 1. See Fig 9 of Hiratsuka. In other words, Hiratsuka discloses the step of the cover 2 is inserted into the can 1. As such, Hiratsuka discloses that its cap is inserted into the can.

Lastly, the Office Action alleges that Hiratsuka discloses a laser welding to weld the cover and the outer can. See col. 5, lines 23-28 of Hiratsuka. However, the laser welding is not equivalent to the method of the claimed invention.

As one skilled in the art would readily recognize, a laser welding method providing a relatively lower weld heat is employed in Hiratsuka. In particular, a pulse laser welding that creates a discrete welding bead is preferred, as disclosed at col. 5, lines 23-28 of Hiratsuka. However, such a pulse laser welding method has drawbacks. For one, it provides a small-sized welding bead where the welding quality is sensitively changed in relation to a welding focus, thereby making it very difficult to provide a perfect sealing of a container without a precise mechanical construction of both battery containers and welding equipment. Additionally, the welding speed is relatively slow because a sufficiently reliable sealing can only be secured when approximately 70% of the welding bead of a small size (0.2-0.6mm in diameter) overlap with the adjacent welding bead. Further, according to the laser welding,

since an upper material must be totally melted while a lower material is partially melted, a relatively large energy is injected. As such, the cooling jig has an important role in comparison to other constructions. However, since it is difficult to install a cooling jig on the container of Hiratsuka due to interference with the electrode, a laser welding is not an efficient method. As such, Hiratsuka does not disclose a laser welding method where the flange of the can is welded so that a sealed container and the protruded terminal is located as close as possible to the first side wall of the can, as recited in independent claim 4.

By contrast, claim 4 recites "a can having a space defined therein while being opened at an upper portion thereof, and a flange extended outwardly from an upper end of the can, the can having a two-stage step formed on one side wall thereof," "a cap having a contact surface facing the flange of the can and the cap is not inserted into the can," "a protruded terminal connected to one of the cathode plate and the anode plate, while being protruded to the outside through the second lower surface of the can," and "the flange of the can is welded at an outer surface of the flange to an outer surface of the can by means of micro-arc welding, thereby forming a sealed container and the protruded terminal is located as close as possible to the first side wall of the can where the two-stage step is formed." Hiratsuka does not disclose or suggest these features and Watanabe does not cure the deficiencies of Hiratsuka. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 1, and claims 11, 14, 16, and 18 depending therefrom, under 35 U.S.C. §103(a).

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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